What is claimed is:

1. A circuit for a cable modem termination system, the circuit comprising:

a backplane interface;

a packet processing engine coupled to the backplane interface; and

a plurality of media access control (MAC) circuits, each media access control circuit coupled to the packet processing engine, each MAC circuit supporting one of N contiguous downstream channels with a single upconverter and each MAC circuit also supporting a plurality of upstream channels.

2. The circuit of claim 1, wherein the plurality of MAC circuits each comprise a MAC circuit that is adapted to conform with the data over cable service interface specification (DOCSIS) standard.

3. The circuit of claim 1, wherein the upconverter has a bandwidth of Y*N MHz, wherein Y is the bandwidth of each of the N downstream channels.

4. The circuit of claim 1, and further comprising a plurality of digital receivers, wherein each digital receiver provides one upstream channel to a selected one of the MAC circuits.

5. The circuit of claim 1, and further including a single downstream port and a plurality of upstream ports.

6. The circuit of claim 5, wherein the downstream port passes all downstream channels and each upstream port passes one or more upstream channel for each downstream channel.

7. The circuit of claim 5, and further comprising a splitter associated with each upstream port.

8. A circuit for a cable modem termination system, the circuit comprising:

a downstream port;

a plurality of upstream ports;

a backplane interface;

a packet processing engine coupled to the backplane interface;

a plurality of media access control (MAC) circuits, each media access control circuit coupled to the packet processing engine;

a downstream signal path that supports a plurality of downstream channels, the downstream signal path comprising:

a plurality of downstream modulators, each coupled to a corresponding one of the MAC circuits to provide one of the downstream channels;

a combiner, coupled to the plurality of downstream modulators, that is adapted to combine the plurality of downstream channels; and

an upconverter, coupled to the combiner and the downstream port, the combiner adapted to upconvert the downstream channels into a plurality of contiguous frequency bands; and

a plurality of upstream signal paths, each signal path including:

a splitter, coupled to one of the plurality of upstream ports, that is adapted to separate out a plurality of upstream channels;

a plurality of receivers, each coupled to an output of the splitter; and

a plurality of demodulators, each demodulator coupled to one of the receivers and a different one of the MAC circuits.

9. The circuit of claim 8, wherein the plurality of MAC circuits each comprise a MAC circuit that is adapted to conform with the data over cable service interface specification (DOCSIS) standard.

10. The circuit of claim 8, wherein the upconverter has a bandwidth of Y*N MHz, wherein N comprises the number of downstream channels and Y comprises the bandwidth of each of the N channels.

11. A method for transmitting a plurality of data channels over a network from a single cable modem termination system, the method comprising:

separately modulating a plurality of downstream data channels;

combining the data channels to form a downstream signal; and

upconverting the downstream signal having the plurality of data channels with a single upconverter.

12. The method of claim 11, wherein combining the data channels comprises combining data channels having contiguous frequency bands.

13. The method of claim 11, wherein upconverting the downstream signals comprises upconverting signals to a band in the 90 to 870 MHz range.

14. The method of claim 11, wherein separately modulating a plurality of downstream data channels comprises separately modulating a plurality of data channels that are compliant with the data over cable service interface specification (DOCSIS) standard.

15. A method for communicating data with a single cable modem termination system, the method comprising:

in the downstream,

separately modulating a plurality of downstream data channels,

combining the data channels to form a downstream signal, and

upconverting the downstream signal having the plurality of data channels with a single upconverter;

for each of a plurality of ports in the upstream,

separating out a plurality of upstream channels, and

separately downconverting and demodulating the upstream channels.

16. The method of claim 15, wherein combining the data channels comprises combining data channels having contiguous frequency bands.

17. The method of claim 15, wherein upconverting the downstream signals comprises upconverting signals to a band in the 90 to 870 MHz range.

18. The method of claim 15, wherein separately modulating a plurality of downstream data channels comprises separately modulating a plurality of data channels that are compliant with the data over cable service interface specification (DOCSIS) standard.

19. A circuit for a cable modem termination system, the circuit comprising:

a downstream port;

a plurality of upstream ports;

a packet processing engine;

a plurality of upstream data paths, coupled between the plurality of upstream ports and the packet processing engine;

a plurality of downstream data paths; and

a single, shared upconverter, communicatively coupled to the plurality of downstream data paths and the downstream port, the upconverter adapted to have a bandwidth that is sufficient to upconvert a plurality of contiguous downstream channels from the plurality of data paths.

20. The circuit of claim 19, wherein the plurality of upstream data ports each receive a plurality of upstream channels.

21. The circuit of claim 19, wherein the plurality of upstream data paths each comprise a splitter and a plurality of receivers coupled to the splitter.

22. The circuit of claim 19, and further comprising a plurality of media access control (MAC) circuits, each MAC circuit coupled to one of the downstream data paths and upstream data paths associated with one upstream data port.

23. The circuit of claim 22, wherein the MAC circuits each comprise a MAC circuit that is adapted to conform with the data over cable service interface specification (DOCSIS) standard.

24. The circuit of claim 19, and further comprising a combiner coupled to the upconverter that combines signals from the plurality of data paths.

25. The circuit of claim 19, wherein the upconverter has a bandwidth of Y*N MHz, wherein N comprises the number of downstream channels and Y comprises the bandwidth of each of the N channels.

26. A system, comprising:

a head end;

at least one optical distribution node, coupled to the head end over an optical fiber, the optical distribution node adapted to convert between optical and electrical signals;

a distribution network, including at least one coaxial cable, coupled to the at least one optical distribution node, and providing connection for subscriber equipment; and

wherein the head end includes a multi-channel cable modem termination system that supports multiple downstream channels and multiple upstream channels on a single circuit.

27. The system of claim 26, wherein multi-channel cable modem termination system comprises:

a backplane interface;

a packet processing engine coupled to the backplane interface; and

a plurality of media access control (MAC) circuits, each media access control circuit coupled to the packet processing engine, each MAC circuit supporting one of N contiguous downstream channels with a single upconverter and each MAC circuit also supporting a plurality of upstream channels.

28. The system of claim 27, wherein the plurality of MAC circuits each comprise a MAC circuit that is adapted to conform with the data over cable service interface specification (DOCSIS) standard.

29. The system of claim 27, wherein the upconverter has a bandwidth of Y*N MHz, wherein Y comprises the bandwidth of each of the N downstream channels.

30. The system of claim 27, and further comprising a plurality of digital receivers, wherein each digital receiver provides one upstream channel to a selected one of the MAC circuits.

31. The system of claim 27, and further including a single downstream port and a plurality of upstream ports.

32. The system of claim 31, wherein the downstream port passes all downstream channels and each upstream port passes one or more upstream channel for each downstream channel.

33. The system of claim 31, and further comprising a splitter associated with each upstream port.